



Genetics and inter-relationship of oil and protein content in crosses involving bunch genotypes of groundnut (*Arachis hypogaea* L.)

L.L. JIVANI, J.H. VACHHANI*, P.M. VAGHASIA, V.H. KACHHADIA, M.B. PATEL AND H.G. SHEKHAT
Main Oilseeds Research Station, Junagadh Agricultural University, JUNAGADH (GUJARAT) INDIA
(Email : lljivani@jau.in)

Abstract : Genetic analysis of oil and protein content was performed in 28 non-reciprocal diallel set of crosses involving eight Spanish bunch groundnut genotypes. Estimates of genetic components of variance indicated that dominance genetic effects were significant for oil and protein contents in F_1 and F_2 generations while additive components were significant only for protein content in F_2 generation. However, the dominance components were greater in magnitude than additive components suggesting the preponderance of dominance in governing these two important quality attributes. The average degree of dominance $(H_1/D)^{1/2}$ was found in the range of over dominance for oil and protein contents having unequal frequency of dominant and recessive genes with more number of dominant genes. Heritability estimates in narrow sense were low for oil and protein content in both the generations. Correlation studies indicated a positive and significant relationship between pod yield and protein content whereas negative between oil content and protein content. Reciprocal recurrent selection scheme for developing confectionery Spanish bunch genotypes having high protein and low oil was suggested.

Key Words : Genetic analysis, Components of variance, Pod yield, Groundnut

View Point Article : Jivani, L.L., Vachhani, J.H., Vaghasia, P.M., Kachhadia, V.H., Patel, M.B. and Shekhat, H.G. (2012). Genetics and inter-relationship of oil and protein content in crosses involving bunch genotypes of groundnut (*Arachis hypogaea* L.). *Internat. J. agric. Sci.*, **8**(2): 338-340.

Article History : Received : 19.11.2011; Revised : 20.02.2012; Accepted : 01.04.2012

INTRODUCTION

Groundnut (*Arachis hypogaea* L.) is the world's fifth most important source of edible oil and vegetable protein. It contains 31-55 per cent oil and 16-34 per cent protein. More than 80 per cent of groundnut production in the country is used for extraction of oil and about 1 per cent is exported for confectionery (HPS) purpose. In autogamous crops like groundnut, recombination breeding has extensively been used to develop the variability reservoir for exploitation in breeding programme. In a systemic breeding programme, it is essential to identify the elite parents for hybridization and superior crosses to expand the variability reservoir for selection of superior genotypes. Before formulation of suitable strategies to breed varieties with specific requirement for oil and protein

contents in groundnut, understanding the relationship and genetic systems governing oil and protein contents are very essential. Although, several studies have been conducted pertaining to the genetics of these quality parameters (Dwivedi *et al.*, 1989). Hence, a study was conducted with 28 non-reciprocal diallel crosses involving Spanish bunch genotypes of groundnut through Hayman's (1954) approach.

MATERIALS AND METHODS

Twenty-eight non-reciprocal diallel crosses involving eight Spanish groundnut genotypes *viz.*, GG 2, GG 5, GG 7, TG 19A, SB XI, FeESG 10, JL 24 and Chico were effected during summer of 2002. Few seeds of F_1 's produced in summer, 2002, along with their eight parents were grown in *Kharif*, 2002 in

* Author for correspondence.